**Stat and Data Analysis Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Ch. 7 and 8 In-Class Review Complete all work on separate paper!**

1. On a typical large plane, there are 150 seats. The chance that the plane is completely filled is 56%. The chance that the plane has 120 seats filled is 24%. The chance that the plane has 70 seats filled is 12% and the chance that the plane has only 30 seats filled is 8%.
   1. Create a probability model for the **number of passengers** on one flight of the plane

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # of people | 150 | 120 | 70 | 30 |
| probability | 0.56 | 0.24 | 0.12 | 0.08 |

* 1. What is the chance that less than 100 seats will be filled?

P(X < 100) = 0.20

* 1. What is the chance that more than 70 seats are filled?

P(X > 70) = 0.08

* 1. What is the chance that the plane would have 30 or 120 seats filled?

P(30 or 120) = 0.32

* 1. What is the chance that the plane is NOT full?

P(150c) = 0.44

* 1. What is the chance that one flight is full, and then the next flight has only 30 seats filled?

P(150 and 30) = (0.56)(0.08) = 0.0448

* 1. What is the chance that the next 3 flights all have 120 seats filled?

P(120 and 120 and 120) = (0.24)(0.24)(0.24) = 0.013824

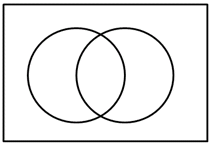
* 1. What is the **expected** attendance on a 747 flight?

E(X) = 123.6 people

* 1. If there are 50 flights in a day, what is the total **expected** attendance?

123.6 \* 50 = 6180 people

1. You own a company and have put a bid on two large contracts. The probability that you win Contract A is 76%. The probability that you win Contract B is 45%. The probability that you win both is 33%.
   1. Create the Venn Diagram



B

A

0.12

0.33

0.43

0.12

* 1. What is the probability that you don’t win Contract A?

P(Ac) = 0.24

* 1. What is the probability that you win Contract A **or** Contract B?

P(A or B) = 0.88

* 1. What is the probability that you don’t win Contract A **but** do win Contract B?

P(Ac and B) = 0.12

* 1. What is the probability that you don’t win Contract A **or** you win Contract B?

P(Ac or B) = 0.57

* 1. What is the probability that you win Contract B **given** you don’t win Contract A?

P(B|Ac) =

* 1. What is the probability that **if** you win Contract A that you don’t win Contract B?

P(Bc|A) =

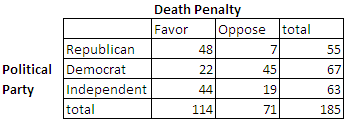
* 1. Is winning Contract A and Contract B independent?

P(B|Ac) = P(B)

0.50 = 0.45

NO! they are not independent

1. Below are the results of a survey of American voters. It lists their political party and their feelings on the death penalty.



Find the probability of the following things.

* 1. Being a Republican P(R) = 55/185 = 0.2973
  2. Opposing the death penalty P(O) = 71/185 = 0.3838
  3. **Not** being an Independent P(Ic) = 1 – P(I) = 1 – 0.3405 = 0.6595
  4. Democrat **and** Favoring P(D and F) = 22/185 = 0.1189
  5. Republican **or** Opposing P(R or O) = 119/185 = 0.6432
  6. Independent **given** that you Oppose P(I|O) = 19/71 = 0.2676
  7. Republican, **if** you Favor P(R|F) = 48/114 = 0.4211
  8. Are Political Party and Death Penalty feelings independent? Justify.

P(R|F) = P(R)

0.4211 = 0.2973

NO! they are not independent

1. You have a special Halloween edition of a bag of candy. The bag consists of black and orange candies. There are 15 black candies in the bag, but only 10 orange candies. You get the bag and pull out two candies.
2. Draw a tree diagram for the possible outcomes of the two candies. Be complete!

B

O

14/24

10/24

B

O

10/25

15/25

= 0.35 = P(B and B)

= 0.25 = P(B and O)

B

O

15/24

9/24

= 0.25 = P(O and B)

= 0.15 = P(O and O)

* 1. What is the probability of getting 2 blacks in a row? P(B and B) = 0.35
  2. What is the probability of getting only 1 orange? P(O = 1) = 0.50
  3. What is the probability of getting at least 1 black? P(B >1) = 0.85
  4. What is the probability of getting an orange candy second? P(Orange second) = 0.40

1. Dan’s Diner employs 3 dishwashers. Al washes 40% of the dishes, Betty washes 25% of the dishes, and Chuck washes 35% of the dishes. However they all break some! Al breaks only 1% of his, Betty breaks 3%, and Chuck breaks 2%.
   1. Create a tree diagram for this situation

A

B

0.35

0.40

0.25

C

Br

N

Br

N

Br

N

0.01

0.99

0.03

0.97

0.02

0.98

= 0.004 = P(A and Br)

= 0.396 = P(A and N)

= 0.0075 = P(B and Br)

= 0.2425 = P(B and N)

= 0.007 = P(C and Br)

= 0.343 = P(C and N)

* 1. What is the probability of Al washing AND breaking a dish? P(A and Br) = 0.004
  2. What is the probability of breaking a dish overall? P(Br) = 0.0185
  3. Given that a dish is **not** broken what is the probability that Betty was washing?

P(B|N) =

* 1. You go to Dan’s Diner for dinner one night, and you hear a dish break in the back. What is the probability that Chuck was the one washing the dishes?

P(C|Br) =

* 1. If you know that no dishes broke one night, what is the probability that Al was washing?

P(A|N) =

1. Suppose it is known that 25% of the country is left handed. You want to see if this is the same in our area. So you decide to sample residents of this area to see if they are left-handed. You take groups of 4 people and record how many of them are left handed.
   1. Write a simulation for this experiment, completing 10 trials.
      * + Outcomes: left handed = 25% other = 75%
        + TRD; left = 00 – 24 other = 25 – 99
        + One trial = 4 people
        + Complete 10 trials
        + Response variable = # of left handed people
   2. Using the TRD section below, perform the 10 trials, showing your work. Record your answers below.

31255 716|09 89887 0|0940 5435|5 44351 89|781 58054| 65813 662|80 56046 5|0526 3364|9 87067 02|697

06577| 16707 96368 47678 70218 28376 98535 34190 96911 81897 31220 50048 03027 25602 34988

95552 76073 69691 51038 63338 88390 41926 71698 21593 60621 41534 84312 96984 84706 28095

91612 99108 26258 38524 27484 73732 70678 00803 29854 42490 28160 78791 42272 16777 87049

|  |  |
| --- | --- |
| # left handed | frequency |
| 0 | || | |
| 1 | ||||||| |
| 2 |  |
| 3 |  |
| 4 |  |

* 1. What is the probability that you had more than 3 left-handed people? P(X > 3) = 0%
  2. What is the probability you get no left handed people? P(X = 0) = 30%
  3. What is the probability that you get 2 people or less? P(X < 2) = 100%
  4. What is the average number of left handed people in your sample or 4? 0.7 people